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ABSTRACT

Eight high school students who were peer tutors in a classroom for students with severe disabilities were matched in pairs and then randomly assigned to interact with and serve as a partner for a classmate with severe disabilities. One participant in the pair received social interaction training, and one participant did not. Statistical analysis indicated that the social interaction training increased the frequency of initiations directed from the nondisabled students toward their partners with severe disabilities. Additionally, there was an increase in the proportion of interactions that were social in nature, with a resulting decrease in the frequency of task-related interactions. There was also a significant increase in targeted social behaviors of the participants with severe disabilities associated with the increase in social interactions with their nondisabled partners. (Contains 40 references.) (Author/JDD)

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THE EFFECTS OF A SOCIAL INTERACTION TRAINING INTERVENTION ON THE SOCIAL BEHAVIORS OF NONDISABLED SECONDARY-AGED STUDENTS TOWARD THEIR SCHOOLMATES WITH SEVERE DISABILITIES

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Abstract

The effects of a social interaction training intervention on the social interactions directed by nondisabled secondary-aged students toward peers with severe disabilities were evaluated in this study. Eight high school students who were peer tutors in a classroom for students with severe disabilities were matched in pairs and then randomly assigned to interact with and serve as a partner for a classmate with severe disabilities. One participant in the pair received the social interaction training intervention, and one participant did not receive the training. A repeated measures, multiple baseline design as well as a nonparametric randomization statistical test were employed to analyze the impact of the intervention on the frequency and nature of the nondisabled participants' social behaviors. The statistical analysis indicated that the social interaction training increased the frequency of initiations directed from the nondisabled students toward their partner with severe disabilities. Additionally, there was an increase in the proportion of interactions that were social in nature, with a resulting decrease in the frequency of task related interactions. There was also a significant increase in targeted social behaviors of the participants with severe disabilities associated with the increase in social interactions with their nondisabled partners. Limitations of the study were addressed as well as the direction of future research with respect to enhancing social relationships between secondary-aged students with disabilities and their nondisabled peers.

The Effects of a Social Interaction Training Intervention on the Social Behaviors of Nondisabled Secondary-aged Students Toward Their Schoolmates with Severe Disabilities

In the past decade the literature has been replete with published reports documenting the positive effects of integrated, community-based instructional models for students with severe disabilities (see Halvorsen & Sailor, 1990). In particular, integrated education, where opportunities for interactions with nondisabled peers are available, has been shown to have many positive benefits for the social abilities of students with disabilities which have included increased rates of social responsiveness (Delquadri, Greenwood, Whorton, Carta & Hall, 1986; Goldstein & Wickstrom, 1986) and increased numbers of social bids directed toward peers (Brinker & Thorpe, 1986; Strain & Odom, 1986). Similarly, opportunities to interact with nondisabled peers have also been shown to enhance the communication skills of students with disabilities such as increased rates of conversational initiations (Eichinger, 1990; Gaylord-Ross, Haring, Breen & Pitts-Conway, 1984; Haring, Roger, Lee, Breen & Gaylord-Ross, 1986) as well as increased maintenance of conversations (Gaylord-Ross & Haring, 1987; Hunt, Alwell, Goetz & Sailor, 1990).

While these studies document the positive effects for students with disabilities, results from three recent qualitative studies suggest that integration with peers who are severely disabled may also benefit the social development of students without disabilities. Biklen, Corrigan and Quick (1989), using data from interviews, described the relationships between elementary students with severe disabilities and their nondisabled peers who participated in an integrated program. The authors found that participation with peers with disabilities enhanced the nondisabled students sensitivity toward other people's differences in general. Furthermore, Peck, Donaldson and Pezzoli (1990) assessed the perceptions of 21

nondisabled high school students regarding the benefits they experienced as a result of developing relationships with peers who had moderate or severe disabilities. The authors found that the nondisabled students experienced improvement in self-concept, growth in social cognition, increased tolerance of other people and reduced fear of human differences. Finally, Murray-Seegert (1989) found that nondisabled students who participated in their high school's peer tutoring program with peers with severe disabilities, began spending more time helping others on their own initiative, as their time increased in the peer tutor program.

Although limited in number, these findings suggest that social integration is beneficial for both nondisabled students and students with disabilities. The nature and frequency of these interactions, however, has not been thoroughly explored. Chadsey-Rusch (1990) found that although secondary-aged students with severe disabilities attended an integrated school, very few interactions occurred between them and their nondisabled peers. Additionally, for students with disabilities at the transition age, the interactions that were observed at school sites, as well as job settings, tended to be task-related rather than social interactions (Chadsey-Rusch, 1990; Chadsey-Rusch & Gonzalez, 1988; Lignugaris/Kraft, Rule, Salzberg & Stowitscheck, 1986). One potential explanation for this finding, based on a review of social interaction models by Gaylord-Ross & Haring (1987), is that for many of the programs in schools designed to foster social integration, the nondisabled students serve as "tutors" for their peers with disabilities which by virtue of the role is task-oriented (Gaylord-Ross & Haring, 1987). The "circle of friends" program (Forest & Lusthaus, 1989), in which nondisabled students and students with disabilities meet for leisure time activities, has been one popular approach toward enhancing friendships between nondisabled students and students with disabilities, but this type of program has not been extended to secondary-aged students.

The purpose of the present study was to examine the extent to which a social interaction training intervention would improve both the frequency and quality (i.e., task vs. socially related interactions) of the interactions between secondary-aged students without disabilities and their peers with severe disabilities. The social interaction training intervention for the secondary-aged students was designed to promote socially-related, rather than task-related, interactions. The impact of the intervention on the social behaviors of the nondisabled participants in the study as well as the training's indirect effects on individually targeted social behaviors of the participants with severe disabilities were measured.

Method

Participants

The students with disabilities. Four students with severe disabilities participated in this study. They attended a class for students with severe and profound multiple disabilities located on a regular high school campus. They were referred by their classroom teacher for inclusion in the study on the basis of their need for appropriate social interactive behaviors. The four students who were selected to participate displayed a wide range of communication, verbal and social skills. Two of the students were female and two were male. Their ages ranged from 15 to 20 years of age. The following descriptions of each of the students are based on information from teacher interviews, school records, observation and other informal assessment procedures.

William was a 15-year old male with severe mental retardation. He often made loud, extraneous noises and talked to himself in a perseverative manner. He was highly distractible and received medication to control his hyperactive behavior. Due to his poor attention span and frequent self-stimulating behaviors, William seldom reciprocated socially with the nondisabled peer tutors in his class who

would attempt to interact with him. When William did interact socially with peers, it was often to greet the other person or to say good-bye. These interactions were seldom extended. William was receiving vocational skill training at various job sites and was learning how to prepare food and shop at grocery stores with assistance.

Ben was a 16-year old male whose primary disability was moderate retardation. Ben was ambulatory, although he was significantly overweight and his movements appeared to be awkward. Ben used simple, but complete sentences to express himself. He was shy with his peers and often used a soft, quiet voice. Due to his timid behavior, Ben often had difficulty interacting socially with peers. In particular, he needed practice with turn taking and making conversation. When he did engage socially with peers, however, it was often in an inappropriate manner. For instance, he frequently stood too close to others, blew kisses at others or engaged in other types of "silly" behavior. Ben was working on vocational skills, domestic skills such as preparing simple recipes, transportation and community skills such as grocery shopping. Although Ben was not working on academics, he did have sight recognition of approximately 20 words, and he was able to write his name.

Kayse was a 16-year-old young woman with mild retardation and multiple orthopedic disabilities which required her to use a wheelchair and to seek assistance for bathing, dressing and eating. Kayse, who came from a home where English was the second language, spoke English at an age-appropriate level but exhibited some articulation problems, and her words sounded stilted. While she was able to effectively initiate conversations with peers, she was often unable to keep the interaction going and often times would abruptly end a conversation with peers. Kayse, who read at approximately a second grade level, participated in some academic activities in English, math and science which were provided within the

special education classroom. She also received training in domestic skills, recreational skills and the use of public transportation.

The fourth participant was Megan, a 20-year old woman with cerebral palsy and moderate retardation. Megan was nonambulatory and used an electric wheelchair. She had limited use of her arms and hands and required total assistance for toileting, dressing and eating. While she was able to verbalize some words, she relied primarily on a computerized communization system which was activated by an infra-red light attached to a head piece to speak to others. Megan was able to understand most everything said to her. She enjoyed the company of peers and would make noises to express her pleasure when interacting with them. However, Megan seldom used her communication system for social purposes which severely limited the amount of "social" information that she would express to others. Megan had some academic skills such as reading simple sentences and adding and subtracting one digit numbers. She was also working on community, transportation and domestic skills. In particular, Megan was working on utilizing her communication system in a variety of settings for a variety of purposes.

The nondisabled students. The eight nondisabled students who were selected for participation in the study were enrolled in a peer tutor program which was an integral part of the high school's curriculum. Seven of the participants were female and one was male. Three of the participants were sophomores, three were juniors and two were seniors. All of the participants had been in the peer tutor program for at least four months prior to the initiation of the study. The peer tutors in the program received class credit for their time in the special education classroom. Participants for this study were selected from members of an established peer tutor program because of the convenience of having time already allotted for them to interact with the students in the special education classroom and because of their

willingness to participate. Students agreed to participate in the study on a voluntary basis.

Setting

Baseline and intervention procedures were implemented within the self-contained classroom which the students with severe disabilities attended. Since all of the participants with disabilities were working on community, transportation, vocational and domestic skills in integrated settings, baseline and intervention data were also collected at various sites outside of the school property. Data was collected throughout the school day, five days a week.

Social Interaction Training

The independent variable in this study was the social interaction training intervention which was provided to four of the eight participants without disabilities who were randomly assigned to receive it. Each of the participants without disabilities were randomly assigned to be the partner of one of the four participants with severe disabilities. The training intervention was given for five consecutive days for 30 to 40 minutes per session. The overall training program incorporated techniques of communication and information sharing, behavior strategies and self confrontation exercises (Ashmore, 1975; Murray & Beckstead, 1983; Schellenberg, 1970).

The first two days of the training focused on ability awareness and information gathering with regard to disabilities in general. It has been suggested that lack of information, social conformity and certain intrapsychic traits (i.e., feelings and beliefs) may contribute to negative attitudes held by nondisabled persons toward individuals with disabilities (Donaldson, 1980; Gottlieb, 1980; Ogbu, 1982; Pumpian, 1981; Voeltz, 1980). Objectives for the participants for these sessions included: a) using appropriate vocabulary to describe developmental disabilities; b)

identifying ways in which people with disabilities are like and unlike themselves; c) listing new and old terms used to describe disabilities; and, d) recognizing that people with disabilities are people first and disabled second.

The purpose of the third training session was increasing the participants' understanding of how certain behaviors of peers with severe disabilities might serve as socially oriented communicative messages (Donnellan, LaVigna, Negri-Shoultz & Fassbender, 1988; Donnellan, Mirenda, Mesaros & Fassbender, 1984; Schuler & Goetz, 1981). The participants were asked during this session to identify specific behaviors and hypothesize possible communicative functions these behaviors might serve, while thinking of their partners with severe disabilities.

The purpose of the fourth session of training was for participants to brainstorm, discuss and practice the use of techniques which were designed to enhance and encourage communication among students with severe disabilities within natural contexts and settings (Carr, 1985; Carr & Durand, 1985; Halle, 1982; Halle, 1987). One primary activity for this session included having participants share ways in which they were motivated to interact with others on a social level and then brainstorm ways in which their partner with severe disabilities might be motivated to interact socially. During this session the participants also practiced ways to initiate social interactions with their partners, and they identified environments and materials which they felt would encourage the social interactions between themselves and their partner.

The final session of training was focused on having the participants design and discuss ways in which nondisabled peers can enhance and promote the context in which social exchanges take place between themselves and peers with severe disabilities (Haring, Roger, Lee, Breen & Gaylord-Ross, 1986). The participants identified factors that keep a social interaction "going," topics of communication that would enhance the social interactions with their partners, and ways in which

their interactions with their partners were age-appropriate and considered to be "normal" for high school aged students. Using cue cards to stimulate discussion, which highlighted their interests and activities, the participants brainstormed ways in which they might promote conversations or activities with their partners, and then they role-played ways to keep the conversation going.

Dependent Measures

The two dependent variables measured in this study were the frequency of the social interactive behaviors of the nondisabled participants toward their partner with severe disabilities and the frequency of the display of targeted social behaviors by the students with disabilities.

Peer interactions. Measures of peer interactions included the frequency of initiations and expansions and the percent of both that were either task or socially oriented. Initiation behaviors were defined as any statements that began a conversation, changed a topic, or provided an instruction to initiate some action. For example, statements such as "Hi", "Good morning", "What do you want to do next?", "Let's go to the store now" on the part of the nondisabled participant would have all served as forms of initiations. In addition, initiations could have been nonverbal in nature such as a handshake or a wave in order to acknowledge the presence of another. Expansions were defined as any follow-up statements, questions or gestures after the occurrence of an initiation which served to continue the social interaction. Verbal statements such as "Go on", "What else did you do?", "Tell me more" or hand gestures to continue would have been measured as an expansion. Lastly, task related interactions were any interactions in which the purpose of the interaction was to accomplish an outcome that went beyond social contact, while socially related interactions were those whose major purpose was the

interaction itself, and no obvious task was being accomplished other than the social contact.

Targeted social behaviors. The targeted social behaviors were measured in this study to determine the extent to which increases in the social interactions between the student with disabilities and his or her partner were associated with increases in specifically targeted social behaviors of the disabled student. Each of the social behaviors targeted for measurement were behaviors identified by the special education teacher as being needed to enhance the individual participants' social abilities.

The behavior selected for William was attending to initiations and/or expansions that were directed to him. Attending to the interaction was defined for William as having his eyes and body directed toward his peer while not engaging in self-stimulatory behavior during the time of the interaction. The social behavior identified for Ben was responding appropriately to the initiations or expansions directed to him from peer partners. Responses were not counted if Ben acted inappropriately such as talking in "baby talk" or blowing kisses to peers. Kayse's target behavior for the study was the use of expansions which were defined as any follow-up statements or questions after the occurrence of an initiation that served to continue a social interaction. Nonverbal behavior such as head nodding or gesturing to go on also served as a form of an expansion. Finally, the target behavior identified for Megan was for her to use her communication system to initiate or continue an interaction with a peer. Megan's communication system consisted of a keyboard attached to a tray placed on her wheelchair, which had pictorial symbols as well as the alphabet on it. When the symbols or letters were activated by an infra-red light which was attached to Megan's headpiece, a computerized voice would relay the message communicated by Megan.

Data collection. Seventeen-minute observational periods for measurement of nondisabled participant's peer interactions and the targeted social behaviors of the participants with severe disabilities were randomly selected within the 50-minute class period of each of the nondisabled participants. An individual naive to the purpose of the study was hired to collect the data. She was trained by the investigator via field observations until there was 80% or greater agreement between them on collected data over 10 consecutive observational periods.

The data collector wore an earphone that was attached to a small tape recorder that signaled the observe and record periods within all intervals. There were a total of forty 25-second intervals within the 17-minute observational periods. The data collector was directed to look for 15 seconds and record for 10 seconds. If she finished recording before the 10 seconds had passed, she continued to look down at the data sheet until the tape announced the start of the next observe interval. If the data collector was unable to be close enough to the participants to score an interval, she would eliminate that interval from the total count. When observing, the data collector scored only the first initiation and expansion in the interval and then indicated whether or not the initiation and/or expansion was task related or socially related and whether the target behavior had occurred for the participant with severe disabilities. The data was summarized at the end of each observation period by dividing the number of initiations, expansions, whether they were social in nature and the target behavior of the student with severe disabilities, by the total number of intervals which were observed.

Educational staff behavior. The behaviors of classroom staff were rated by an observer on the average of every fifth to seventh day to insure that staff behavior relevant to the promotion of social interaction was consistent across all dyads of participants including the nondisabled students who received training and the students who did not receive training. Five minute observational measures were

taken on the presence of the following behaviors: a) staff directed behaviors toward the nondisabled student with regard to their social interactions with their partner with severe disabilities; and, b) rate of positive and negative verbal statements directed by the staff toward the nondisabled participants (both trained and nontrained) during their interactions with their partner with severe disabilities.

Reliability

Interobserver reliability was collected by the investigator and data collector across baseline and intervention phases for all of the participants. The reliability checks were randomly selected across the phases of the study for 27% of the total number of observational periods. Interobserver agreement on the occurrence or nonoccurrence of initiations, expansions, the type of interaction (i.e., social or task-related) and the targeted social behaviors of the participants with severe disabilities was calculated by dividing the number of agreements by the number of agreements plus disagreements, the resulting ratio being multiplied by 100 to yield a percentage of agreement. An agreement was scored when both observers identified the occurrence of the same types of social behaviors within the same interval.

Procedures

Design. For this study, a multiple baseline design (Tawney & Gast, 1984) across four pairs of participants was used to demonstrate the effectiveness of the social interaction training program on increasing the frequency of the nondisabled participants' social behaviors toward a partner with severe disabilities. This design was implemented in order to make the following analyses: a) comparison across each pair of participants of the social interactive behaviors across baseline, training and post-training phases; b) comparison within each pair (i.e., the student who received training with the student who did not receive training), of the social interactive behaviors across baseline, training and post-training phases; and, c) the

indirect effects of the social interaction intervention on the targeted social behaviors of the participants with severe disabilities.

Baseline. Prior to the initiation of the baseline phase, the eight nondisabled participants were matched in pairs according to their grade level and sex. The pairs were also matched so that they were not in the same peer tutoring period together. Each of the four pairs of participants were then randomly assigned to "tutor" one of the four students with severe disabilities. The special education teacher then scheduled each of the eight nondisabled tutors to tutor their assigned partner with severe disabilities on a daily basis.

In order for the setting and activities to be similar across the two participants in each pair, the special education teacher scheduled activities and environments that were either very similar or identical for each. For example, if nondisabled student A took Megan to the grocery store to choose a lunch item, nondisabled student B would also be scheduled to take Megan to the store to shop for a specific item. The special education teacher was also instructed to continue to set up activities for his peer tutors as he normally had prior to the start of the study with the exception of assigning similar activities for the participants in each pair.

The 17-minute observational periods for each participant were randomly selected from the 50-minute class time, although the first and last five minutes of the class period were excluded from the random selection. Three days prior to initiating baseline, the data collector took practice samples during each classroom period in order to desensitize the students in the classroom to her presence. During baseline and subsequent phases, at the beginning of each period the data collector would put her head set on and begin observing the students, although she was not collecting data at that point. Typically, the data collector sat in the same chair when she was in the classroom observing, and she was approximately three to ten feet away from the participants during the observational periods. When the data

collector had completed her observational time sample, she continued to keep her head set on until the period ended. If the students went off campus or out of the classroom, the data collector would follow approximately five feet behind.

Training. One participant was randomly assigned to receive the social interaction training intervention. The training phase for each participant lasted five consecutive days. The other participant continued to receive the same instructions for interacting with the identified peer with severe disabilities as was previously provided during the baseline condition. The data collector continued to measure the dependent variables on all participants during the training phase including those participants who were receiving training and those participants who were not receiving training. For the participants who received the intervention, the training sessions took place away from the special education classroom, usually outside on the campus grounds. The sessions were conducted during the participant's normal peer tutoring period, either during the beginning 20 minutes of the class period or 20 minutes at the end of the class period. Once the training session was completed for the day, the participants returned to the classroom or the setting where their partner with severe disabilities could be found or went on to their next class.

Post-training. After the social skill training intervention was completed for the selected participant, the dependent variables continued to be measured for both participants (the one who received training as well as the participant who served as the control) during the post-training phase. At this point, however, the students who had been trained were now identifying the activities which they would participate in with their partner with disabilities. The activity was generally decided on a day before it would occur and the special education teacher would also schedule a similar activity the next day for the participants who had not received training and their partner with disabilities.

Data Analysis

A statistical analysis was combined with a visual presentation of the data to determine whether there were differences in the percentage frequency of initiations, expansions, the target behaviors of the participants with severe disabilities and the percentage of initiations and/or expansions that were social in nature, as a function of the experimental condition (social skills training intervention). Nonparametric randomization tests have been suggested for the analysis of data from small sample interrupted time series designs (Edgington, 1967, 1975, 1980a, 1980b, 1980c; Levin, Marascuilo & Hubert, 1978) and were employed in this study.

A variation of Edgington's (1980b) procedures, which were extended by Marascuilo and Busk (1988) to apply to multiple baseline designs, was used to analyze differences in percentage frequencies for the dependent measures by collapsing the data across the four participants who received training during the baseline and experimental phases. Given the researcher's hypothesis that the training's effects would carry over into the post-training phases, the training and post-training data were collapsed. The same analyses were then conducted by collapsing the data across the four participants who served as controls in the study and who did not receive the social skills training intervention.

Edgington's procedure is based on the difference in phase means and is given by:

$$\overline{d}s = \overline{Y}_{AS} - \overline{Y}_{BS}$$

With four participants, a normal approximation is used to combine the data across participants. For these data:

$$\underline{I} = \overline{\underline{d}}_1 + \overline{\underline{d}}_2 + \overline{\underline{d}}_3 + \overline{\underline{d}}_4$$

$$E(\underline{I}) = E(\overline{\underline{d}}_1) + E(\overline{\underline{d}}_2) + E(\overline{\underline{d}}_3) + E(\overline{\underline{d}}_4)$$

$$Var(\underline{I}) = Var(\overline{\underline{d}}_1) + Var(\overline{\underline{d}}_2) + Var(\overline{\underline{d}}_3) + Var(\overline{\underline{d}}_4); \text{ and,}$$

$$\underline{Z} = [I - E(\underline{T}) / \sqrt{var(7)}].$$

The null hypothesis at $\propto = .05$ is .05 with the one-tailed alternative at $\mu_A < \mu_B$.

Results

Reliability

There was an average of 92% agreement between the investigator and the data collector across 68 of the 250 (27%) 17-minute observational time samples represented across all phases and participants. The range of agreement was from a low of 80% to a high of 100%.

Educational Staff Behavior

A total of 19 observational checks on staff behaviors were taken across the eight nondisabled participants in the study: two checks on six participants, three checks for one student and four checks on one student. The range of frequency for physical or verbal prompts of staff directed behavior toward participants was from 0 to 2 across the 19 validation checks. The range of frequency of positive verbal reinforcement directed by staff to the participants was also from 0 to 2 across the total number of validation checks. The number of prompts and positive reinforcements were consistent across all participants. These data suggest that none of the nondisabled participants was receiving a greater amount of staff attention while interacting with her partner with severe disabilities.

Social Interaction Training

The mean percentage frequency of initiations, expansions, the frequency of initiations and/or expansions which were measured to be socially related and the targeted behaviors of the participants with severe disabilities are summarized in Table 1 across baseline, training and post-training phases. There were a total of 23 intervals which were omitted from the observational periods due to the data collector not being close enough to the participants to score the interval.

Insert Table 1 about here

Baseline. The graphed data for the percentage frequency of initiations are presented in Figure 1. During the 17-minute observational sessions, the mean percentage of initiations for the eight nondisabled participants ranged from 5% to 32%. The participants who were randomly assigned to received the social skills training intervention during the training phase initiated social interactions with their partners with severe disabilities for 32%, 27%, 5%, and 28% of the time. The participants who were not selected to receive the training intervention initiated social interactions with their partners with severe disabilities for 30%, 15%, 17% and 23% of the time, during baseline sessions, indicating no stable differences between the two groups.

Insert Figure 1 about here

The graphed data for the percentage frequency of expansions are found in Figure 2. During the baseline phase, there was a mean percentage frequency range from 2% to 41% of occurrence of expansions among the eight nondisabled

participants. The participants selected to receive training expanded their social interactions with their partners with severe disabilities for 27%, 12%, 2% and 39% of the time. The control participants had a mean percentage of expansions of 41%, 4%, 17% and 22% during baseline sessions, again indicating no stable differences between the groups on this variable.

Insert Figure 2 about here

The percentage frequency of initiations and/or expansions which were measured to be social in nature are presented in Figure 3. During baseline sessions, trained participants initiated and/or expanded interactions on a social level with their partners with severe disabilities for a mean of 33%, 4%, 15% and 27% of the time. Control participants had percentages of initiations and/or expansions on a social level with their partners for a mean of 12%,2%, 38% and 23% of the time during baseline sessions. These data indicate no stable differences found between the groups on this variable prior to intervention.

Insert Figure 3 about here

The graphed data of the percentage of occurrence of the targeted behaviors of the participants with severe disabilities are found in Figure 4. During the 17-minute baseline observational sessions for Megan, the mean percentage of responding with her communication system was 13% when she was with her trained partner and 28% when she was with her untrained partner. William had a mean percentage of attending to interactions for 16% when he was paired with his trained partner and 40% when he was paired with his untrained partner during baseline sessions.

During baseline sessions for Ben, the mean percentage of responding appropriately to peers was found to be 16% when he interacted with his trained partner and 49% when interacting with his untrained partner. Kayse, who's targeted social behavior was expanding during a social interaction, had a mean percentage frequency of 34% occurrence of expansions when she was paired with her trained partner and 16% occurrence of expansions when she was paired with her untrained partner during baseline sessions. These baselines, though reflecting variability from session to session, were reasonably stable within pairings.

Insert Figure 4 about here

Training. During this period, there were four nondisabled participants who were randomly assigned to receive the social skills training intervention which occurred over five sessions. The four participants who did not receive training, continued to receive the same instructions that were presented during the baseline phase. During the training sessions, participants who received training, experienced an increase from baseline sessions in their frequency of initiations directed toward their partner with severe disabilities (see Figure 1). The participants who did not receive training during this phase, revealed no systematic pattern in the data from the frequency of initiations toward their partners with severe disabilities.

The mean percentage of expansions (see Figure 2) during the training sessions for the participants who received the training also increased for two of the participants from baseline sessions, but showed no systematic effects for the other two. For the participants who did not receive training, three of the participants showed no systematic training effects and one of them showed a decrease in frequency of expansions.

The mean percentage of initiations and/or expansions which were determined to be social in nature increased from baseline sessions for three of the four participants who received the intervention. During training sessions three of the control participants showed no systematic effects from baseline to training sessions. One participant experienced a decrease in the frequency of social initiations and/or expansions from baseline to training phases.

Finally, during the training sessions for Megan, the mean percentage of responding with her communication system (see Figure 4) increased from baseline sessions when she interacted with her trained partner and decreased slightly from baseline sessions when she interacted with her control partner. William had an increase in the mean percentage of attending to interactions from baseline sessions when he was with his trained partner and he experienced a small decrease from baseline session when he was with his control partner during the training sessions. During training sessions for Ben, the mean percentage of responding appropriately to peers increased from baseline sessions when he was paired with his trained partner and decreased dramatically when he was paired with his control partner. Kayse also experienced an increase from baseline sessions in the mean percentage of occurrence of expansions when she interacted with her trained partner and she experienced a decrease in expansions from baseline sessions when she interacted with her control partner.

Post-training. Following the five days of training sessions, there was a post-training phase for each of the groups of participants in which there was no follow-up training or instructor's feedback provided to any of the participants. For all of the trained and untrained participants, the mean percentage of initiations (see Figure 1) during these sessions approximated the baseline levels of performance, thus revealing no systematic, long-term, post-training effects.

The mean post-training percentage of expansions (see Figure 2) for the trained participants revealed systematic positive effects for two of the participants and no systematic differences for the other two participants. For the control participants there were no systematic effects found from training to post-training phases.

The percentage of initiations and/or expansions which were social in nature (see Figure 3), showed a systematic positive effect for one of the trained participants and no systematic effects for the other trained participants. The control participants showed no systematic differences for three of the participants and a systematic decrease in frequency for one of the participants during the post-training sessions.

During the post-training sessions, the mean percentage of targeted social behaviors (Figure 4) showed systematic positive effects for each of the participants with disabilities in the presence of their trained partners. There were no systematic effects found for the mean percentage of targeted social behaviors when the participants with disabilities were in the presence of their control partners from training to post-training phases.

Statistical analyses. The results of the randomization tests to determine whether there were statistically significant differences between baseline and training phases (collapsing across training and post-training phase data) for the percentage frequency of initiations, expansions, target behaviors of the participants with severe disabilities and the percentage of initiations and/or expansions which were social in nature (collapsing across the four participants who received training) are presented in Table 2.

Insert Table 2 about here

Using a one-tailed test, the results show that the percentage frequency of initiations, the percentage frequency of the target behaviors of the participants with

severe disabilities and the percentage of initiations and/or expansions which were social in nature, were significantly higher during the treatment phase than during the baseline phase for the participants who received the social skills training intervention. There were no statistically significant differences found between baseline and training phases for the percentage frequency of expansions.

The results of the randomization test for the participants who served as controls (collapsing across participants) are also presented in Table 2. Using a one-tailed test, there were no significant differences found between baseline and training and post-training phases for the dependent measures across the control group.

Discussion

Four nondisabled secondary-aged students were provided with a social interaction training intervention with the intent of facilitating higher frequencies of initiations and expansions directed towards peers with severe disabilities. Additionally, the social interaction training was designed to promote social, rather than task-related interactions. The possible indirect effects of the training was also evaluated through measurement of targeted social behaviors for each of the participants with severe disabilities. Four nondisabled secondary-aged students who did not receive the social interaction training served as controls.

A nonparametric statistical analysis of the data revealed that the social interaction training significantly increased the frequency of initiations and the proportion of interactions that were social in nature when the data was collapsed across the four nondisabled participants who received training. Additionally, there was a statistically significant increase in the targeted social behaviors of the participants with severe disabilities when they interacted with their trained nondisabled partners. For the control participants, there were no statistically

significant differences found among the collapsed data for the four dependent measures between baseline and training phases.

The results suggest that the social interaction training was effective in increasing the percentage frequency of the dependent measures with the exception of expansions which were not shown to be statistically significant. Based on these promising findings, continued research in this area appears to be crucial for validating the importance of providing planned opportunities for social interactions between students without disabilities and students with severe disabilities at the secondary-aged level. Perhaps the most encouraging finding in the study was related to the potential indirect effects the training had on the participants with severe disabilities who all experienced an increase in their targeted social behaviors when they interacted with their trained partner during the training and post-training phases. Although it was not possible to pinpoint the variable responsible for this positive side effect, future research in this area should include identification of the interactive behaviors of nondisabled students that promote the social skills of students with disabilities.

Limitations found in this study included subject selection and the matching of the pairs of participants. First, the nondisabled participants were students who had previously volunteered for a peer tutoring program. Therefore, they may not have been characteristic of the typical secondary-aged student. The data may have revealed different results in interactive behaviors if the training had been provided to nondisabled students who had no experience interacting with disabled peers. Secondly, although the nondisabled students were matched in pairs by age and sex, a visual inspection of the data shows that the matched students varied considerably on the dependent measures during the baseline phase. By matching students who had similarly low rates of interactive behaviors to begin with, some of the inconsistencies in the data may have been alleviated. Finally, based on subjective

evaluation of the intervention by the trainer, future training of this kind may be even more effective if follow-up sessions after the training are provided to participants in order to give them an opportunity to review the skills they have learned as well as problem-solve difficulties they are possibly experiencing. Additionally, provision of a follow-up training may have alleviated the differences found among groups from the training to post-training sessions.

Most importantly, the results of this study indicate that planning for reciprocal interactions must be done in a structured manner. If we want social interactions to occur between students with and without disabilities, we must provide an effective and efficient training approach for enhancing their occurrence and, we must be prepared to follow through with our efforts.

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Table 1
Percentage Means for the Four Dependent Measures

Initiations

Trained Participants	Baseline	Training	Post-Training
Carole	32%	34%	29%
Mary	27%	38%	33%
Janna	5%	24%	14%
Celia	28%	41%	32%
Control Participants			
Kim	30%	24%	21%
Beth	15%	23%	9%
Mike	17%	8%	19%
Kristy	23%	4%	24%

Expansions

Trained Participants	Baseline	Training	Post-Training
Carole	27%	32%	32%
Mary	12%	34%	31%
Janna	2%	26%	13%
Celia	39%	42%	48%
Control Participants			
Kim	41%	17%	22%
Beth	4%	14%	7%
Mike	17%	6%	19%
Kristy	22%	6%	20%

Percentage of Initiations and/or Expansions Which Were Social

Trained Participants	Baseline	Training	Post-Training
Carole	33%	41%	52%
Mary	4%	35%	30%
Janna	15%	33%	45%
Celia	27%	60%	42%
Control Participants			
Kim	12%	17%	26%
Beth	2%	2%	8%
Mike	38%	39%	11%
Kristy	23%	0%	16%

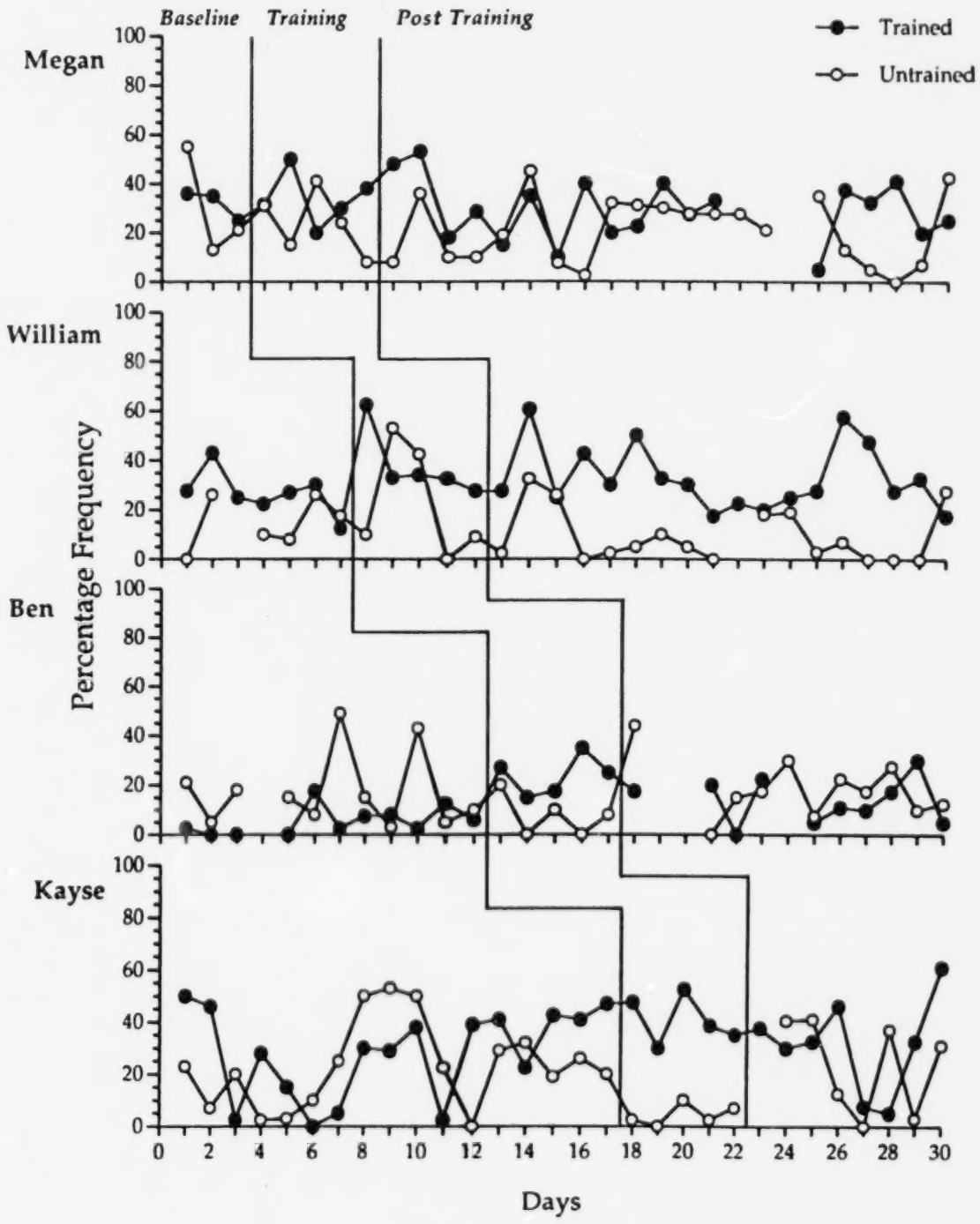
Table 1 continued

Target Behaviors of Participants with Severe Disabilities

Trained Participants	Baseline	Training	Post-Training
Megan w/Carole	13%	30%	33%
William w/Mary	16%	56%	63%
Ben w/Janna	16%	66%	57%
Kayse w/Celia	34%	47%	57%
Control Participants			
Megan w/Kim	28%	25%	21%
William w/Beth	40%	39%	17%
Ben w/Mike	49%	2%	47%
Kayse w/Kristy	16%	10%	24%

Table 2
Differences Between Baseline and Training Phases for Experimental and Control Participants

	Z	Critical value at α = .05, one tailed	Result
Initiations			
Experimental	-1.69	-1.645	Significant treatment effect
Control	1.04		Not Significant
Expansions			
Experimental	-1.42	-1.645	Not Significant
Control	1.77		Not Significant
Percent of Interactions Which Were Social			
Experimental	-1.69	-1.645	Significant treatment effect
Control	-.01		Not Significant
Target Social Behavior			
Experimental	-2.60	-1.645	Significant treatment effect
Control	1.60		Not Significant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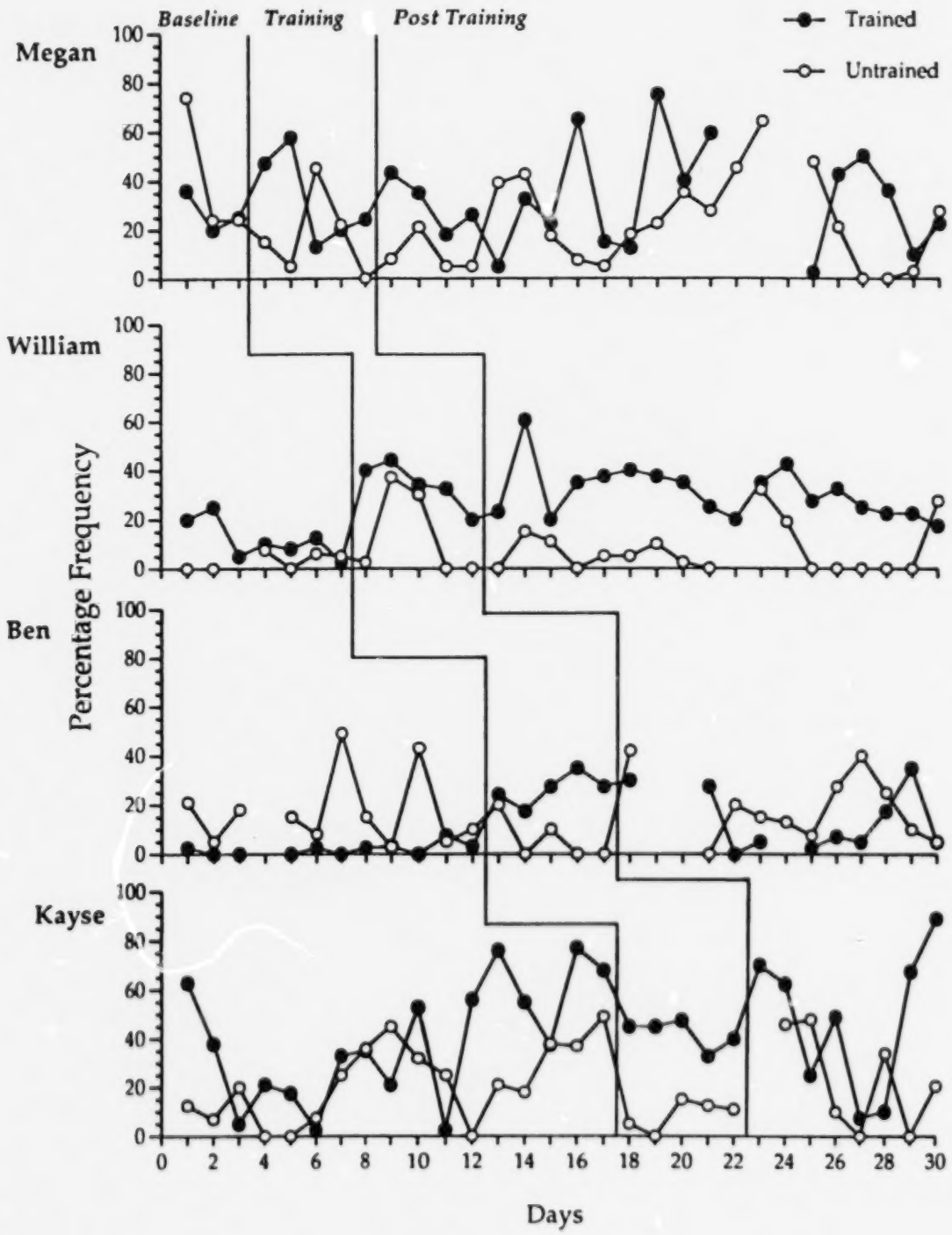
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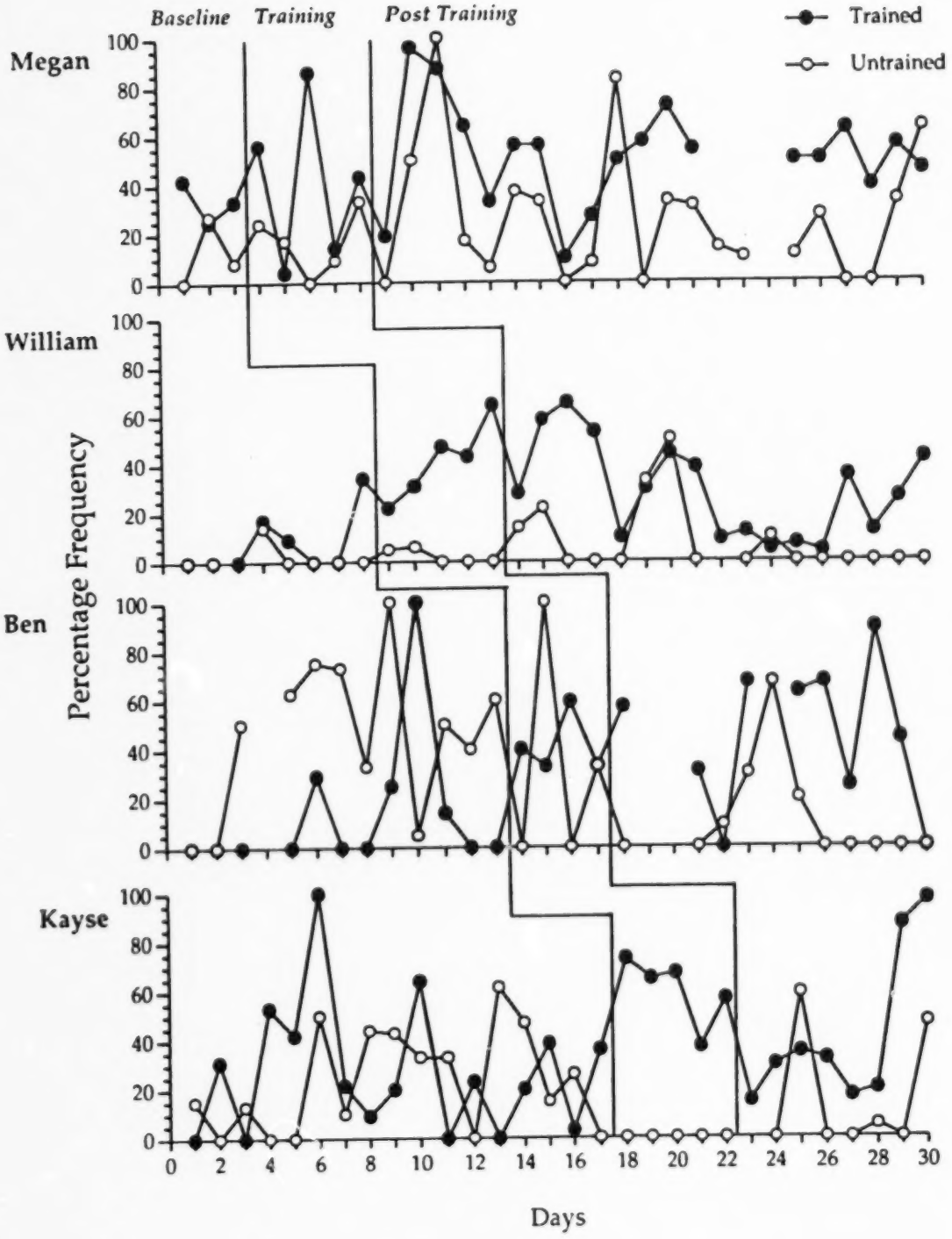
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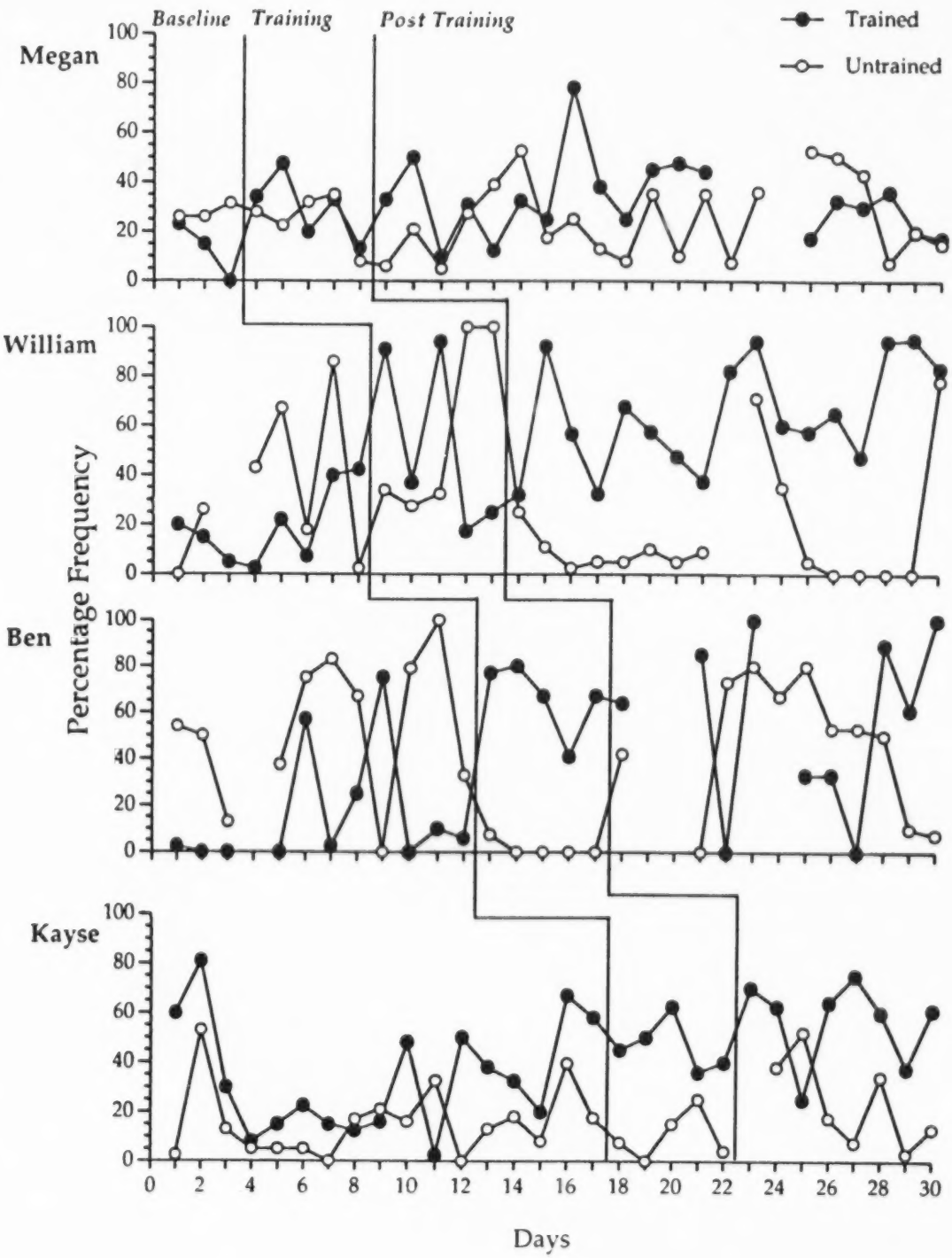
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